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CHAPTER 6

CARGO BIKES: DISTRIBUTING CONSUMER GOODS

Peter Cox and Randy Rzewnicki

Introduction

Any commodity destined for individual purchase and use will undergo a long distribution chain from producer to consumer. Given the combination of mass production and a mass-consumption society, distribution patterns can be seen as dendritic, spreading from manufacturer to buyer, involving ever finer levels of dispersal and reduction in numbers, alongside ever more diverse modes of distribution. There are, of course, other commodity flows between sources and raw materials and production, and of labour within these processes. This chapter considers the role of human powered vehicles: bicycles and tricycles, in this mundane distribution of consumer goods. Bulk-produced, quotidian items, from foodstuffs to newspapers to clothing are consumed at an individual and household level and cargo bikes of a variety of designs have long been envisaged as part of this chain of commodity distribution from retailer to consumer.

The problem of luggage carrying was recognized from the very earliest days of the bicycle, and various forms of pannier, basket, rack and bag arrangements can be seen, dating back as far as 1817, when a luggage platform was an integral feature of many draisines – the “running machines” usually considered as the precursors of the pedal driven bicycle (Hadland & Lessing, p. 353).

In a satirical set of drawings commenting on the new craze for velocipedes, the Leipzig *Illustrierte Zeitung* of 3 July 1869, carried a sketch of a wheelbarrow-velocipede hybrid, complete with cargo of an unfeasibly large sausage. Actual cycles designed expressly for commercial goods carriage have been around since the 1880s. Classic examples include the production of cycles for newspaper distribution, for post office use, and for retailers of foodstuffs: butchers, bakers and grocers, as well those used by individual vendors selling to passing pedestrians. From the late 1970s, within a more individualized consumer culture, the transporter cycle has re-emerged as a personal vehicle in Denmark, the Netherlands and elsewhere: property of the consumer household rather than the retailer. Finally, in the twenty-first century, we are seeing the cargo bike returning as a commercial delivery vehicle as retailing patterns change again in a digital communications era, and logistics becomes a major concern. This chapter maps the changing fortunes of cargo bikes not simply as design objects, but in relation to, and as a function of, changing forms of retail and consumer culture. It demonstrates that to understand the fortunes of some forms of cycling we must look beyond the fascination of the technology itself and understand its place within wider cultural changes here, in particular, by studying the changing face of consumer culture and its role in society.

Interest in sustainable mobility has drawn attention to the “last mile” journey of consumer goods (Edwards et al. 2009). The “last mile” refers both to final delivery to the customer at the end of the entire production, distribution and retail chain, and the redistribution of goods from the

point of purchase to the point of use by the customer/consumer. In reality, of course, it is very rarely a last mile and can be a considerable distance indeed. With neo-liberalism producing cities that are “increasingly defined by elites through and by consumption”, this final redistribution of goods is increasingly crucial as a means by which the character of the urban environment is, and can be, defined and redefined (Miles, 2012, p. 216). Yet it is also clear that the mobility patterns of the final dispersal of goods are intimately bound up with the character of shops and the processes of shopping as they have changed over the past 150 years.

The emergence of a sociology of consumption (see e.g. the *Journal of Consumer Culture*) has refocused attention on the history of shops and shopping, but has tended to emphasize issues of place and identity in the consumer (e.g. Miller et al., 1998). Historical studies provide valuable data on changing patterns of retail but again, emphasis in these is more on retail and consumption rather than distribution (see e.g. Strasser et al., 1998; Bowlby, 2001; Graham, 2008; Francks & Hunter, 2012). To map the changing fortunes of cargo bikes in their various forms, this chapter utilizes a range of sources. First, it employs manufacturers’ descriptions of their machines, and draws from contemporary reports of their uses in trade, press and other cyclists’ magazines. Second, it builds on existing academic studies of the history of shops and shopping. A third element, used with some caution, is the range of accounts compiled by enthusiasts. These literary sources are combined with insights from within a current international project on the use of cargo bikes in sustainable urban transport, allowing

insights into the policy arena and discussions from an insider perspective. Although the specific details and the material on the earlier history of retail are largely drawn from the UK, the international nature of the bicycle trade allows us to make a number of comparative observations (Burr, 2012). The more recent resurgence of cargo bikes has become transnational in scope although retaining distinctive local characteristics and so the final sections of the chapter also draw on practitioner accounts of the promotion and current use of cargo bikes.

As a relatively invisible transport mode, much of the historical evidence is often fragmentary and passing, drawn from the marginalia of secondary sources and photographic records. Studying these machines and their use is further complicated by the complete lack of common nomenclature. Throughout the chapter, the general terms *cargo bike* or *carrier cycle* are employed, with note of, and use made of, local and historic terminology where appropriate, and specific terms as applied to particular vehicle types where necessary. As Hadland and Lessing (2014, p. 380) put it, “Cargo bikes are also known as freightbikes, carrier cycles, work bikes, and tradesman’s bikes and are sometimes referred to generically as delibikes, baker’s bikes, or butcher’s bikes”: and this only in the English language. Among this profusion, we should be reminded that many of the designs do not have two wheels and for many others, the cargo may be human passengers rather than inert goods.

Origins

In one of the few academic studies of working cycles, Norcliffe (2011) sketches their origins to James Starley’s

three tricycle designs of 1877, all of which could be adapted to carry either passengers or goods. In parallel to spread of the high-wheel (ordinary) cycle there was a proliferation of tricycle construction and use, in which the carrier tricycle, Norcliffe argues, building on his earlier (2001) work, represented the novelty of modernity itself. That the carrying capacity of the novel designs could apply to either goods or passengers alerts us to another layer in the working cycle story and one that has been and remains vitally important. The passenger-carrying cycle – in its various passenger rickshaw forms – is almost certainly the most numerous type of working cycle in existence today. Rickshaws, boda boda (bicycle taxis) and other passenger carrying cycles demand their own history and will have to remain largely outside the scope of this chapter (see *Transfers* (2013) 3(3) “Special Section on Rickshaws” for recent work).

The development of the “safety” bicycle in the late 1880s did not displace existing tricycle designs but offered new possibilities for tricycle layout and construction. Further, the safety bicycle principle (in which indirect drive allows for smaller wheels and a seating position nearer to the ground) offered new possibilities for the construction of carrier bicycles. For the manufacturer, the potential of practical uses for the cycle provided a second, expanding market. The solo bicycle of the 1890s was not immediately conceived of as a practical utility transport vehicle (Clyde, 1895). It was a superb design for the leisure of gentlemen and ladies and for the pursuit of sporting endeavour, but its employment by workers who would have to carry the tools of their trade required degrees of adaptation. More importantly,

the sheer price of cycles kept them out of reach of most British workers in the 1890s except as a transport provided by their employers (Cox, 2015). Elsewhere, where cycle prices were relatively lower, *The Wheel and Cycle Trader* (USA, 19 February 1897) could report that their

observer is surprised to see the general use which the bicycle has found amongst the mechanics in that northern country [Denmark]. It is made to serve as a valuable tool in the furtherance of various trades and masons, bricklayers, carpenters and such can be seen speeding along the streets.

It was therefore at employers that specifically built carrier cycles (and trailers, produced during the same period) were aimed – especially since they cost twice the price of a standard bicycle.

The economic division between the middle classes (about 25–33% of the population) who could afford servants to run the domestic household and those employed by them to do so, shaped the pattern of late Victorian retail. Although only some 10% of workers were in service by 1900, the gulf between workers' wages and the middle classes enabled the boom in consumer goods in the latter years of the nineteenth century as a form of conspicuous consumption (Veblen, 1899). The bicycle itself was one of the beneficiaries of the cyclical boom–bust of rapidly changing fashions, particularly between 1896 and 1898. The distinction between the sale of items of fashionable and discretionary purchases and the retail and distribution of household necessities mimicked the class distinctions of the household divisions

of labour. The middle-class woman might be desirous of time to spend in a fashionable department store, but it would be a task for the maidservant to arrange for the purchase of the mundane items of grocery that she or the cook would be preparing.

Prior to the adoption of any form of self-service, the Victorian retailer, even of the most everyday goods, was a salesperson mediating between the customer and the object. As mediator, the retailer would also usually be expected to deliver as well as supply. And it was in this space that the working bicycle was offered as a means to increase efficiency. Two alternatives were available: animal traction delivery services by cart or wagon, or handcart. The carrier cycle not only offered the symbolic imagery of modernity, but also practical advantages. It could carry as much as a handcart but cover significantly more distance in the same time. Although providing less carrying capacity than animal traction, there were no constant running costs and it could easily be left unattended or unused (and unfed).

It is not surprising therefore that we see the early appearance of what were to become the iconic uses of delivery cycles – for butchers, bakers and grocers – even at this early stage. Characteristic of the design of solo bicycles around the turn of the century was the gradual reduction of diversity and the production of similar models from year to year (Oddy, 2007). For cycles intended for trade purposes, however, while yearly innovation is absent, the variety of designs only seems to have multiplied as responses to the problem of cargo carriage produced an increasing variety of ever more specialized solutions.

It is also worth noting that the bicycle was an international trade commodity. While localized production and innovation is clear in the pages of trade journals, so too is the constant exchange of ideas and news from markets around the globe (see, for examples *The Wheel and Cycling Trade Review* and the *Referee and Cycle Trader* (both USA) and *Kaleidoscop* (Germany)). Consequently, news of new designs and developments travelled rapidly and manufacturers constantly looked for market opportunities. Perhaps one of the most striking examples is the export of Jin Riksha (hand-drawn rickshaws) from the USA to Japan in the late 1890s where American manufacturers took advantage of the current underdevelopment of Japanese production facilities (*The Wheel and Cycle Trader*, 12 October, 1899, p. 16). One surprising – but also obvious – development of cargo bikes for goods distribution was those built to carry bicycles themselves. Cycle retailers in both US and Germany could purchase carrier tricycles for the express purpose of carrying bicycles.

Cycle use spread to the masses at different times in different European locations, as price controls on cycle sales and working wages shifted relative to one another (Cox, 2015). Nevertheless by the end of the 1920s bicycles had become the most numerous vehicles on the roads, and provided autonomous and independent mobility to ever widening classes of people. Despite changes in patterns of physical mobility and against the background of economic depression and widespread unemployment, patterns in general retailing and the transport of goods to the customer were relatively unchanged. At the upper end of the retail business, stores

such as Harrods employed fleets of electric delivery vehicles to provide final distribution of customer purchases. Initially using vehicles purchased from the USA, between 1936 and 1939 they built a fleet of sixty vehicles to their own specification. For the ordinary vendor of provisions, on the other hand, a simple bicycle provided a far more realistic means to distribute (relatively) low-bulk goods. Cargo bikes in many forms provided a means for the efficient reproduction of capital and the growth of the city (Bonham & Cox, 2010). In other European nations, cargo bikes were similarly used. In Germany, under National Socialism, cycle companies (as well as providing cycles specifically designed with party insignia to indicate one's loyalty) listed carrier cycles as part of their standard ranges. Even though the catalogues of (for example) Phänomen-Werke Gustave Hiller Ag from 1934 and 1936 show very little design variation from the 1908 range, they continued to include a trade bike in their range of eight models (including one motorcycle). Alongside the general catalogue, the carrier cycle was described in a separate brochure, indicative perhaps of the different clientele for whom it was intended. Its unique selling point was the design of a front carrier with an integral stand, (i.e. under the centre of the load, and the basket could be arranged in three different positions providing different load-carrying options from a 52 x 34 x 10 cm high basket to a 52 x 46 cm flatbed. The latter would be an obvious option for goods transported already presented loaded on trays, for example bakery and patisserie deliveries. Photographic records demonstrate the ubiquity of working cycles in the Netherlands and Denmark, and a majority of general cycle manufacturers

list at least one model especially strengthened for portage purposes, as well as there being a number of forms specializing exclusively in working cycle production, in a wide range of specialized designs.

In France, the newspaper industry – which extensively used cycle sport to sell newspapers – also employed specially built or adapted cycles for paper distribution. In keeping with the sponsorship of racing, successive newspapers ran a Critérium de Porteurs de Journaux and a Championnat des Triporteurs. In these events the newspaper delivery riders raced cargo tricycles loaded with up to 40 kg of ballast (Metz, n.d.). These races started in 1895, reached a heyday during the 1930s and continued on until the 1960s, although steadily decreasing in importance. Triporteurs, carrier tricycles with two wheels at the front creating a space for cargo, had been produced since the turn of the century (see e.g. Nöll, 2011 p. 171) and were in widespread manufacture during the 1920s. The French firm of Blotto, in common with others, also produced motorized versions, so fulfilling the niche of micro-van. From these earlier celebrations of utility, we can see the declining status of the triporteur in popular culture, in France at least, by the two films of Darryl F. Zanuck (1957) and *Le Triporteur* [1957] and *Robinson et le Triporteur* [1959]) in which the rider of the local delivery cycle is a figure of comic ridicule, rather mocked and looked down on. The machine has become a signifier of obsolescence.

Outside of European cities – the metropolitan centres of empires – the practical working cycle underwent its most profound and lasting development with the advent of the cycle-rickshaw. Hand-drawn rickshaws had become ubiquitous means for transporting goods and

passengers in cities across East Asia since their inception in the 1860s (Gallagher, 1992). Combining the transport body of a hand-drawn rickshaw with the drive and steering of a cycle, the cycle rickshaw provided yet another variation of working tricycle design and one which was almost synonymous with Asian urban mobility by the latter part of the twentieth century. Passenger rickshaw design varies regionally (Wheeler & I'Anson 1998), some designs echoing passenger tricycles of the 1890s rather than the 1930s model. Whatever their design, their capacity to carry considerable loads, whether human passengers or cargo, allows rickshaws greater penetration into retail distribution, carrying both product and customer. They serve their delivery purposes not only from store to home but at most stages of the distribution cycle. (Although passenger-carrying cycles and trailers have been built sporadically since the 1890s, passenger traffic by bicycle remained almost entirely absent in twentieth-century Europe, the only examples found so far being in photographs of the Warsaw ghetto in 1941/2, Bundesarchive, Berlin).

After 1945

We have suggested above that the style of working cycles in local use corresponds to the structure of the retail sector. In turn, this is further connected to patterns of urbanization and industrialization, income distributions and household compositions, including gender roles in relation to domesticity and labour markets. Further complexity can be added to this mix when we consider national variations in cultural histories and associations of cycle use with social class and social status. In the rapid

changes of post-war Europe through the 1950s and 1960s, it is not surprising that we also see considerable changes in the use of working bikes. Although parallel to the decline of cycle use for personal transport, we suggest that the reasons for the decline of working cycles are not quite the same.

The impact of fuel restrictions during the Second World War had served to consolidate the centrality of the bicycle as a prime utility vehicle, not simply for personal transport, but for the continued supply of smaller goods in local areas. Yet the very ordinariness of delivery cycles accounts for their near invisibility in historical accounts. Working cycles, used as trade vehicles, however, were not just subject to the general decline in social value of the bicycle from the 1950s onwards, but victims also of profound changes to goods distribution from the very late 1950s through to the 1970s: part of the emergence of new forms of consumer society and of transformations in retailing. Firstly, during this period there are transformations in the structure of middle-class households. Domestic service almost entirely disappears and in its place, married women's roles became more firmly identified with householding and domestic responsibility (Johnson & Lloyd, 2004; Freeman, 2004). This resulted in a change in the purchaser: the domestic householder was now directly concerned with purchase of everyday necessities.

For retailers, the growth of direct payment and self-service reshaped the shopping experience. The purchaser no longer had to speak first to a salesperson, who would then issue a chit for goods which would have to be taken to a separate payments desk (or simply put on account).

The traditional separation between act of purchase and the actual acquisition of the goods by the purchaser made delivery services a logical extension of the service function of the supplier. Although most familiar as a system in department stores, this same system was used even in small village shops. Self-service systems allowing direct contact between the customer and the goods, together with increasing volumes of direct cash transactions (rather than operating on account) allowed the retailer to cede responsibility for goods at the point of sale direct to the customer. Indeed, the point of sale moves into the store, rather than being a protracted process of accounts held with regular delivery and payment in an ongoing relationship between localized customers and goods suppliers. Self-service and direct payment shifted primary responsibility for the transport of purchases from the retailer to the customer/consumer.

In turn, the growth of motorized mobility, first by motorcycle and scooter and later by private cars, facilitated growth in the radius of travel available, allowing customers to choose from a greater range of locations for shopping and breaking the direct link with sole local suppliers. This assisted the breakdown of regular, locally dependent relationships necessary for the success of a delivery business. One important cause of this was the profound drop in energy costs relative to wages that occurred across Europe during the 1950s (Pfister 1998). By 1969 in the United Kingdom, 50% of households had access to a car, and this increased mobility and carrying capacity provided the spaces for the symbiotic expansion of the supermarket. Increases in married women's employment levels during the 1970s

also helped support the logic of the supermarket and its ability to consolidate shopping for necessities into a single transaction. The private car provided a means to easily transport the larger volumes of goods resulting from this weekly grocery-shopping trip. By the mid 1970s, the cargo bike as a means of goods distribution was all but extinct and with the loss of trade sales went most of the few remaining independent manufacturers of tradesman's and carrier cycles in the UK (for example the Leonard Gundle Motor Co. Ltd which closed in 1974), most others having disappeared in the consolidations of the cycle industry in the 1960s although Raleigh continued production until the 1970s (Rosen, 2003).

The Cargo Bike is Dead, Long Live the Cargo Bike

Almost as soon as the working cycle as a function of trade had died, it was to be reborn with a subtly different identity. The bicycle re-emerged in Europe in the 1970s as both practical transport and, more importantly for our case here, as a symbol of critical social values and of a growing environmental consciousness (Rosen, 2002; Horton, 2006; Stoffers & Cox, 2010). As relatively simple machines, bicycles have considerable longevity, especially those built for robustness. Ending commercial production did not mean their disappearance. Similarly, they are relatively easy vehicles to construct on a small scale with only basic tooling and metalworking skills. This made bikes of all sorts ideal components of counter-cultures, especially those encompassing concepts of autonomy and those critical of the car-dominance and its impact on both urban and rural life.

To claim the bicycle as primary practical transport in northern Europe in the 1970s (whether at individual or at state level) was to pass comment on the increasing dominance of private motor traffic. It is not surprising that we see new designs of cargo-practical carrier cycles and trailers made and distributed through counter-cultural networks and communities. Most famous are the Christiana bikes first built in 1976. But at the same time, in Uden (Netherlands) old carrier bikes were being rehabilitated and celebrated in a Bak-en Transportfietsenrace (in its seventh edition by 1982). Manufacture for trade may have disappeared but the practicality of personal ownership of bicycles specifically built with load-carrying in mind, especially those items or volumes of goods not easily accommodated on a conventional solo bicycle, has an obvious appeal for those who choose not to use a private car. As the promotion of alternatives to urban car use accelerated in the 1980s and 1990s, so too load-carrying cycles – cargo bikes of all styles – became a clear, specialist niche. Modern cargo bikes provide a means by which their users can participate in societies characterized by systems of automobility, but without necessarily participating in an automotive lifestyle.

The cargo bike had a role in the formation of twentieth-century consumer capitalism, as a means of distribution of consumer products. Its place disappeared as the retail trade outsourced final distribution to the customer – part of the customer's transitions to consumer, enabled by the growth of private motor transport. The cargo bike re-emerged as a counter-cultural alternative to the car, enabling continued participation in societies

restructured by automobility (Alvord, 2000; Urry, 2004). As recognition of the unsustainability, impracticability and undesirability of accommodating universal urban private motoring (and the rebuilding of cities necessary to facilitate this) has spread, so what was once the basis of a marginal critique has been translated into mainstream policy for many European cities. Thus the cargo bike re-emerges as an obvious and logical household transport option regardless of its recent counter-cultural heritage where discourses of sustainable transport policy have traction.

The discussion of the changing identity and fortunes of the working cycle in Europe should not blind us to its very different histories elsewhere around the globe. Although beyond the scope of this chapter, it is clear that the twentieth century narrative of the working bike as a function of the organization of trade should produce different histories outside of the geographical limits of this study. Fieldwork studies in Rio de Janeiro demonstrate that, despite being almost invisible from official statistics, locally produced cycles of a wide range of designs continue to be used for a range of goods delivery services, carrying items as large as mattresses. Cycles also serve the role of mobile retail units, bringing goods to the customer on the street and selling items as diverse as meat and jewellery. The sale of ice cream and other goods from mobile refrigerators and freezers mounted on tricycles is not limited to European history. Street traders across the globe use bicycles as mobile bases for business, demonstrating adaptations and innovations to suit their particular needs. For some retailers today, the use of the bicycle is a signifier of green

credentials or of a commitment to broader social values, while for others it may simply provide an innovative sales pitch and talking point to increase brand recognition.

Some European delivery services, particularly those involved in carriage of mail and the couriership of other small packaged goods have provided continuous patterns of cycle use and kept carrier cycles in the public eye. Post offices are perhaps one of the strongest examples, although the Royal Mail here in the UK is perhaps atypical in phasing out bicycle postal deliveries in 2014, bucking the trend of other delivery services. Although disappearing from view, working bicycles and tricycles of all types have proved remarkably resilient and even when subject to legislative bans (for example, in Jakarta) have continued to be used. There is considerable scope for a lot more detailed research in this area where a long past impacts upon a mutable present.

Over 100 years from the first generation of cargo bike designs, the end of the twentieth century and the early years of the twenty-first have seen a flourishing of European cargo bike design and production. Initially, however, these were characterized by a reverse relationship to retail and the reproduction of capital. The trade bike prospered in the first half of the twentieth century as it offered increased efficiency for delivery services over its alternatives (handcart, horse or motor traction). For its advocates at the end of the twentieth century, the working cycle began to spread as an item of domestic ownership. In increasing variety of designs, carrier bicycles and tricycles have become iconic in the promotion of cycle-friendly cities. However, since the mid 2000s, a new generation of cargo bikes has begun to

appear as a vital element in commercial use once more. It is to this resurgence – a third phase of cargo bike use – that we now turn our attention.

The Re-Invention of the Commercial Cargo Bike

The advent of the digital economy, just-in-time delivery systems and rapid rises in energy costs in the transport sector have brought an almost unprecedented importance to logistics for all sorts of commercial activities, not just retail. For urban deliveries, the first and last mile poses major problems of expense and congestion. Since most goods, regardless of weight, reach their final destination in city centres in motorized cars, vans and trucks logistic companies have to fight for limited space. Further, large trucks and lorries are becoming unpopular within urban areas among both policy makers and politicians concerned not only with congestion, pollution and wear and tear on roads but for their disproportionate involvement in collisions (Dutch Institute for Road Safety Research, 2009) and cyclist fatalities (Schoon et al., 2008). Additionally, there are significant pressures arising from the need to take the sustainability agenda seriously, especially in light of CO₂ emissions in the transport sector. Consequently, cities are increasingly looking towards reducing freight traffic within cities and urban areas. City centres are frequently being closed off to delivery vans, wholly or at particular times of day. Vehicles may also be subject to congestion charges or other regulations which add significant economic burdens on urban logistics.

These transformations of the urban environment make the operation of working cycles an increasingly

attractive commercial option once more, whether for dedicated logistics operators, or for other delivery options for individual or corporate retailers. DHL Netherlands reported saving €430,000 per year after replacing thirty-three trucks with thirty-three cargo bikes. Since July 2012, the European Cycle Logistics Federation (ECLF) has brought together organizations from advocacy and commercial sectors, seeking to expand the commercial use of cargo bikes in European cities as a means both to combat congestion and to provide “green credentials with zero carbon emissions” (www.ecf.com/projects/cyclelogistics-2/). The ECLF was officially incorporated in 2014 (<http://federation.cyclelogistics.eu/>) and counted over 150 members. It was created under the auspices of the CycleLogistics project, (<http://www.cyclelogistics.eu/>) co-funded by the EU Intelligent Energy – Europe Programme, from 2011 to 2014. The project promoted the use of cargo bikes for the movement of goods in EU cities. The project team calculated that 51% of logistics trips made in EU cities with motor vehicles could be replaced by cycle trips. Other projections showed that 25% of commercial deliveries could easily be shifted to cycles. This potential was one reason why EU funding was forthcoming for a new project.

Running from 2014 to 2017, CycleLogistics Ahead (www.cyclelogistics.eu/) targets business and municipal sectors as potential new users of cargo cycles in a range of applications where current motor vehicle use is deemed unwarranted. A number of similar projects are also in action to explore the potential of new electric vehicle, including pedelec cycle-based delivery and distribution

systems, again echoing the restructuring of the commercial mobility landscape a century ago.

What we see is a very rapid transformation of a single technology from the icon of a cultural critique (a cachet which it still possesses, at least in part, for many users) to the emblem of a more efficient city. The economic case for the use of working cycles for urban distribution and delivery services is strong. Just as cycle (and motorcycle) messenger services have provided specialist delivery services through the second half of the twentieth century, the incorporation of cargo-carrying cycles to these kinds of operations enables the expansion of these services to provide a constant flow of deliveries through urban spaces, unimpeded by many of the restrictions that hinder conventional motor vehicles. A further element of the digital economy to have major impact on retailing is the growth in online shopping. Expanding volumes of home deliveries, especially in small items, coupled with market liberalization of postal systems, leads to heightened competitiveness, and services that offer any kind of marginal advantage are increasingly attractive.

Production of cargo bikes is now no longer just the domain of small-scale local manufacture. The German Chancellor Angela Merkel visited the 2013 Eurobike tradefair and posed with a cargo bike produced by Accell, a major cycle producer. New product design enables contemporary cargo bikes with three or four wheels to carry considerable loads, up to 250 kg. Reihle (2012) documented six different models on the retail market that claim maximum payloads of 400 kg. The potential of both smaller and larger capacity cargo bikes is now being explored in relation to new logistical models for freight

distribution, using peri-urban hubs for large-scale drop-offs, the hubs then acting as bases for localized distribution networks. Systems approaches to logistical efficiency, with cargo bikes as an integral part of the network, offer considerable gains not just in environmental sustainability, but in making cities places for people, not motor vehicles.

Conclusions

An extremely broad range of factors has shaped the changing fortunes of the working bicycle, most of which are extrinsic to the machine. Household patterns and the division of domestic labour has been crucial. The availability of independent mobility, relative fuel costs, retailers' own prioritizations (bottom line versus USP [Unique Selling Point]) and the state of class relations between retailer and customer have all played parts.

At its simplest, the story of European working cycles is a story of the role of the commerce they have served. As patterns of retail and distribution have changed, so the fortunes of commercially operated bicycles have risen and fallen according to their location within a bigger picture. Their re-emergence and re-manufacture by independent innovators in the late 1970s is a notable irregularity, but a logical corollary of renewed emphasis on cycles as transport in a period when the mainstream cycle industry had largely relegated cycles to a role as leisure products. The sheer longevity of many trade bicycles also contributes to their persistence in private ownership, and the continued presence of working bikes in key roles, even when invisible in other uses, enabled them to maintain a presence in the imagination.

If we consider the cargo bike as a cultural phenomenon, we can see a number of distinct phase changes in its perceptions and place. The same basic object can be read as a signifier, changing its meaning for different social groups over time as both users and contexts change. At the end of the 1890s, as Norcliffe demonstrates, the cargo bike appears as a symbol of modernity. General bicycle manufacturers' catalogues include them within their main body, as an indicator of their versatility and comprehensiveness. As the ubiquity of the bicycle was embedded in the everyday life of inter-war Europe, specialist manufacturers of carrier cycles grew to meet the diverse needs of businesses alongside the offerings of major companies. Because unremarkable, like the everyday bicycle for transport, it had become transparent to the point of invisibility. Towards the end of the 1950s, not only was it no longer a signifier of modernity, but increasingly functionally redundant as delivery services were abandoned in place of self-service and direct sales.

But no sooner had increasing mobility throughout the general population signalled the demise of commercial retail delivery services, than counter-cultural critiques of that motorized mobility – its impact and implications – created new spaces for cargo bikes. Cargo bikes and trailers became symbolic of new possibilities of mobile life, especially urban mobility. In the changing contexts of urban development policy, they move from signifiers of alternative lifestyles to symbols of rational choice. It is in this last mode that the cargo bike wheel turns full circle, as the economic rationality of carrier cycles as a logical choice for business makes them once more a desirable

commodity. This is not only in simple monetary economic terms, but also as indicators of business commitment to improving urban life. Once again they become symbols of a new progressivism for more sustainable futures.

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